MODEL NO. ATX1200 (Haswell ,200-240V 87PLUS)

This specification describes the requirements of 500W,550W,600W,650W,700W with active P.F.C Switching Power Supply with an ATX form-factor,+5V standby voltage, fan control, ATX 12V Power supply version 2.3, remote on/off control, dual line input capability and forced air cooling characteristics.

☞ 1.0 Table1. AC INPUT requirements

The input voltage, current, and frequency requirements for continuous operation are stated below.

Parameter	Min	Nom.	Max	Unit
Vin	180	200 - 240	264	VACrms
Vin Frequency	47	50	63	Hz
Iin(500W)		4		A
Iin(550W,600W)		4.5		A
Iin(650W,700W)		5		A

1.1 Inrush current limiting

100 A @ 230Vrms (at 25oC ambient cold start)Can not damage during the ON/OFF test

☞ 2.0 DC OUTPUT

2.1 Table 2. DC voltage regulation

Parameter	Range	Min	Nom.	Max	Unit
+3.3V	+/-5%	+3.14	+3.3	+3.47	Volts
+5V	+/-5%	+4.75	+5.0	+5.25	Volts
+12V	+/-5%	+11.40	+12.0	+12.6	Volts
-12V	+/-10%	-10.80	-12.0	-13.2	Volts
+5VSB	+/-5%	+4.75	+5.0	+5.25	Volts

2.2 Load Ranges

2.2.1 Table4 Typical Power Distribution for 500W ATX12V Configuration

Parameter	Min	Nom.	Max	Peak	Unit
+3.3V	0.1	-	18	-	Amps
+5V	0.2	-	16	-	Amps
+12V	0.15	-	38	-	Amps
-12V	0.0	-	0.3	-	Amps
+5VSB	0.0	-	2.5	-	Amps

Note:1. Total combined output load of +3.3V and +5V is ≦110W.

2. +12V Maximum output power should not exceed 456W.

3. Maximum continuous total DC output power should not exceed 500W.

4. Peak DC output power should not exceed 520W for 12 second.

2.2.2 Table4 Typical Power Distribution for 550W ATX12V Configuration

Parameter	Min	Nom.	Max	Peak	Unit
+3.3V	0.1	-	18	-	Amps
+5V	0.2	-	16	-	Amps
+12V	0.15	-	42	-	Amps
-12V	0.0	-	0.3	-	Amps
+5VSB	0.0	-	2.5	-	Amps

Note:1. Total combined output load of +3.3V and +5V is ≦110W.

2. +12V Maximum output power should not exceed 504W.

3. Maximum continuous total DC output power should not exceed 550W.

4. Peak DC output power should not exceed 570W for 12 second.

2.2.3 Table5 Typical Power Distribution for 600W ATX12V Configuration

Parameter	Min	Nom.	Max	Peak	Unit
+3.3V	0.1	-	**20**		Amps
+5V	0.2	-	**17**		Amps
+12V	0.15	-	**46**		Amps
-12V	0.0	-	**0.3**		Amps
+5VSB	0.0	-	**2.5**		Amps

Note:1. Total combined output load of +3.3V and +5V is ≦120W.

2. +12V Maximum output power should not exceed 552W.

3. Maximum continuous total DC output power should not exceed 600W.

4. Peak DC output power should not exceed 620W for 12 second.

2.2.4 Table5 Typical Power Distribution for 650W ATX12V Configuration

Parameter	Min	Nom.	Max	Peak	Unit
+3.3V	0.1	-	**20**		Amps
+5V	0.2	-	**17**		Amps
+12V	0.15	-	**50**		Amps
-12V	0.0	-	**0.3**		Amps
+5VSB	0.0	-	**2.5**		Amps

Note:1. Total combined output load of +3.3V and +5V is ≦120W.

2. +12V Maximum output power should not exceed 600W.

3. When +12V load is over 20A,+5V min load is 0.5A.

4. Maximum continuous total DC output power should not exceed 650W.

5. Peak DC output power should not exceed 670W for 12 second.

2.2.5 Table3 Typical Power Distribution for 700W ATX12V Configuration

Parameter	Min	Nom.	Max	Peak	Unit
+3.3V	0.1	-	**22**	-	Amps
+5V	0.2	-	**18**	-	Amps
+12V	0.15	-	**54**	-	Amps
-12V	0.0	-	**0.3**	-	Amps
+5VSB	0.0	-	**2.5**	-	Amps

Note:1. Total combined output load of +3.3V and +5V is ≦130W.

2. +12V Maximum output power should not exceed 648W.

3. When +12V load is over 20A,+5V min load is 0.5A.

4. Maximum continuous total DC output power should not exceed 700W.

5. Peak DC output power should not exceed 720W for 12 second.

2.3 DC Output Ripple/Noise.

2.3.1 Talbe3 Ripple regulation

Parameter	Ripple&Noise	Unit
+3.3V	50	mVp-p
+5V	50	mVp-p
+12V	120	mVp-p
-12V	120	mVp-p
+5VSB	50	mVp-p

2.3.2 Definition

The ripple voltage of the outputs shall be measured at the pins of the output connector when terminated in the load impedance specified in figure 1.Ripple and noise are measured at the connectors with a 0.1uF ceramic capacitor and a 10uF electrolytic capacitor to simulate system loading. Ripple shall be measured under any condition of line voltage, output load, line frequency, operation temperature.

2.3.3 Fignre3. Ripple/Noise voltage test circuit

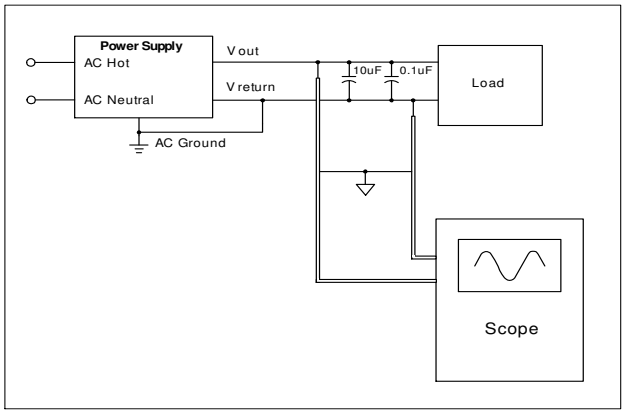


Figure 3. Ripple/Noise voltage test circuit

2.4 Overshoot

Any overshoot at turn on or turn off shall be less 10% of the nominal voltage value,all outputs shall be within the regulation limit of section 2.0 before issuing the power good signal of section 5.0.

2.5 Efficiency

Power supply typical efficiency is 87% under full Load at nominal input voltage of 230VA

2.6 Remote on/off control

When the logic level "PS-ON" is low, the DC outputs are to be enabled.
When the logic level is high or open collector, the DC outputs are to be disabled.

☞ 3.0 PROTECTION

3.1 Over-power protection

The power supply will be shutdown and latch off when output power is 110%~160%.

3.2 Over voltage protection

The over voltage sense circuitry and reference shall reside in packages that are separate and distinct from the regulator control circuity and reference. No single point fault shall be able to cause a sustained over voltage condition on any or all outputs. The supply shall provide latch-mode over voltage protection as defined in Table.

Output	Minimum	Nominal	Maximum	Unit
+12 VDC	13.4	15.0	17	Volts
+5 VDC	5.74	6.3	7.5	Volts
+3.3 VDC	3.76	4.2	4.8	Volts

3.3 Over Current Protection

500W

Parameter	Min.	Max.	Unit
+12V	42	60	A

550W

Parameter	Min.	Max.	Unit
+12V	46	68	A

600W

Parameter	Min.	Max.	Unit
+12V	51	74	A

650W

Parameter	Min.	Max.	Unit
+12V	55	80	A

700W

Parameter	Min.	Max.	Unit
+12V	60	85	A

500W,550W,600W,650W,700W

Parameter	Min.	Max.	Unit
+3.3V	25	45	A
+5V	25	45	A

No damage or hazardous condition should occur with all the DC output connectors disconnected from the load. The power supply may latch into the shutdown state.

3.4 Over temperature protection

The power supply will be protected against over temperature conditions caused by loss of fan cooling or excessive ambient temperature. In an OTP condition the PSU will shutdow When the power supply temperature drops to within specified limits, the power supply shall restore power automatically. The OTP circuit must have built in hysteresis such that the power supply will not oscillate on and off due to temperature recovering condition.

☞ 4.0 TIMING

4.1 Signal timing drawing

Figure 4 is a reference for signal timing for main power connector signals and rails.

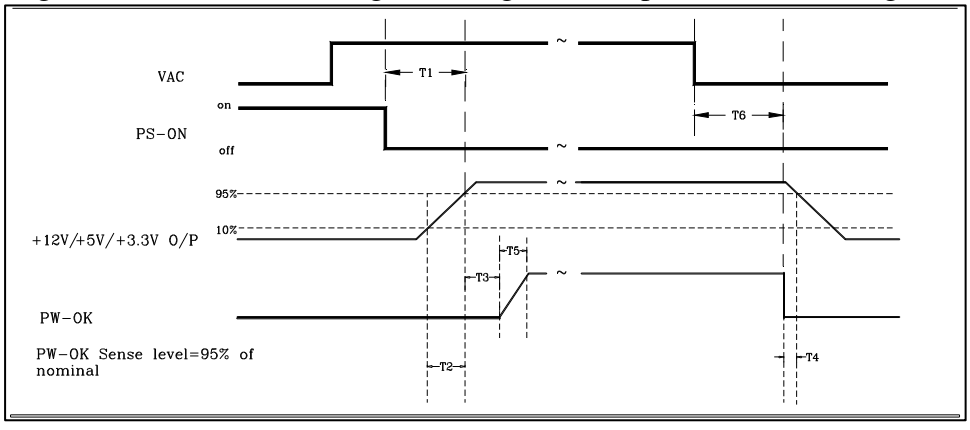


Figure 4. PS-OK Timing Sequence

(1)T2: Rise time (0.1ms~20ms)

(2)T3: Power good turn on delay time (100ms~500ms)

(3)T4: Power good turn off delay time (1ms min)

(4)T5: Rise time (10ms max)

4.2 .Output Transient Response

Table 13. summarizes the expected output transient step sizes for each output.
The transient load slew rate is =1.0A/us.

Table 13. DC Output Transient Step Sizes

Output	Max.step size (% of rated output amps per Sec 3.2.3)(1)	Max.step size (amps)
+12 VDC	40%	
+5 VDC	30%	
+3.3 VDC	30%	
-12 VDC		0.1A
+5 VSB		0.5A

(1)For example, for a rated +5 VDC output of 18A,the transient step would be 30% x 18A=5.4A Output voltages should remin within the remain within the regulation limits of Section 2.1,and the power supply should stable when subjected to load transients per Table 13. from any steady state load, including any or all of the following conditions:

* Simultaneous load steps on the +12 VDC,+5 VDC,and +3.3 VDC outputs (all steps occurring in the same direction)
* Load-changing repetition rate of 50 Hz to 10 kHz
* AC input range per Section 1.0
* +5Vsb Loading min 0.1A
* +12V loading min 0.6A

4.3 Hold up time (T6 of figure 4.)

When the power loss its input power, The output shall maintain **12ms** in regulation ranges Tested at **75%** of maximum load and AC:230V/50Hz.

4.4 Capacitive Load-REQUIRED

The power supply should be able to power up and operate with the regulation limits defined in Table 15,With the following capacitances simultaneously present on the DC outp

Output Capacitive Loads

Output	Capacitive Load(uF)
+12VDC	10000
+5VDC	10000
+3.3VDC	10000
+5VSB	6000
-12VDC	330

☞ 5.0 ENVIRONMENT

5.1 Operation

Temperature	0°C to 35°C at AC 230V full Load
Relative Humidity	20 to 85%, non-condensing

5.2 Shipping and Storage

Temperature	-10 TO 50°C
Relative Humidity	5 to 90%, non-condensing

5.3 Altitude

Operating	3,000FT max.
Storage	15,000FT max.

☞ 6.0 SAFETY

6.1 Underwriters Laboratory (UL) recognition.

The power supply designed to meet UL 60950.

6.2 The power supply must bear the German Bauart Mark from NEMKO.

☞ 7.0 ELECTROMAGNETIC COMPATIBILITY (EMC)

7.1 ELECTROSTATIC DISCHARGE (ESD) - IEC 61000 – 4 - 2：2008

7.2 ELECTRICAL FAST TRANSIENT / BURST (EFT/B) – IEC 61000 – 4 - 4：2012

7.3 SURGE – IEC 61000 – 4 - 5：2005

7.4 POWER FREQUENCY MAGNETIC FIELD – IEC 61000 – 4 - 8：2009

7.5 VOLTAGE DIPS – IEC 61000 – 4 - 11：2004

7.6 RADIATED SUSCEPTIBILTY – IEC 61000 – 4 – 3：2006+A1：2007+A2：2010

7.7 CONDUCTED SUSCEPTIBILTY – IEC 61000 – 4 - 6：2008

7.8 VOLTAGE FLUCTATION - EN 61000 – 3 – 3：2008

7.9 EN61000-3-2：2006+A2：2009 harmonic current emissions.

If applicable to sales in Europe, the power supply shall meet the requirements of EN 61000-3-2 Class D and the Guidelines for the Suppression of Harmonics in Appliances and General Use Equipment Class D for harmonic line current content at full-rated power.

7.10 EN55022：2010/AC：2011 Class B Radio interference (CISPR 22).

7.11 ANSI C63.4-2009 / FCC Part 15 Subpart B / ICE-003 lssue 5 class B 115VAC operation.

☞ 8.0 MTBF

8.1 MTBF (MEAN TIME BETWEEN FAILURES) CALCULATION

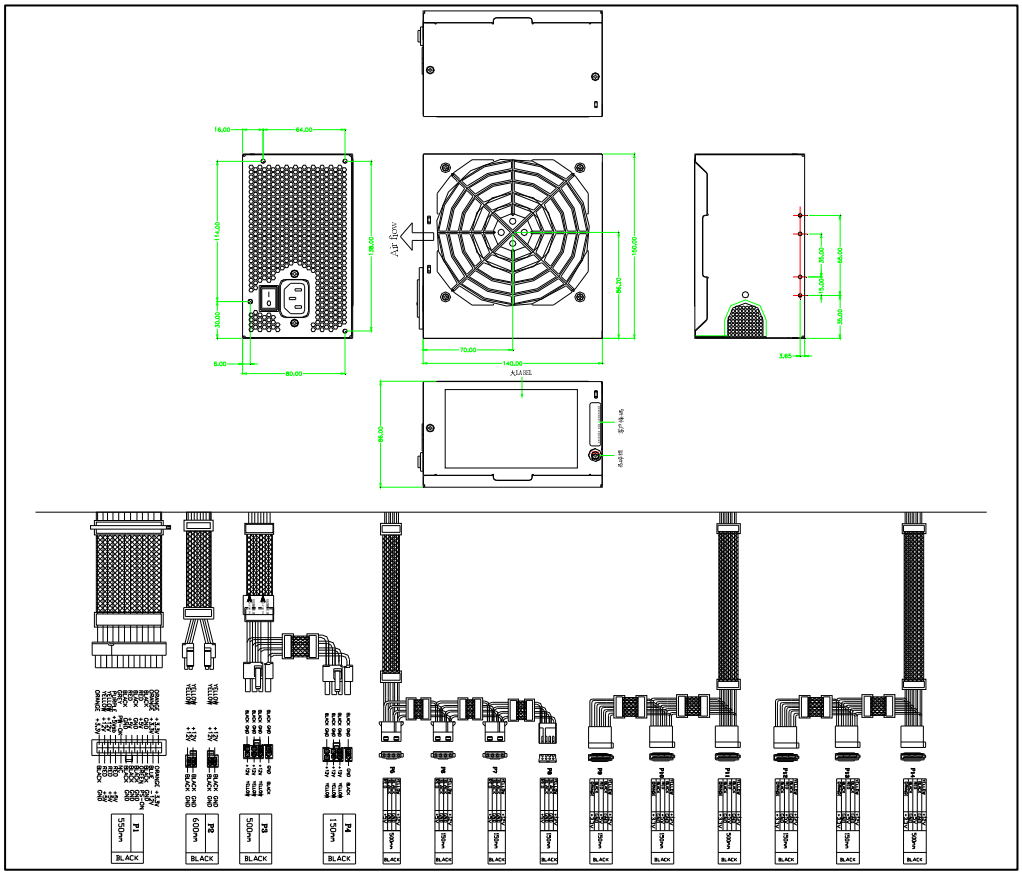
The demonstrated MTBF shall be 100,000 hours of continuous operation at 25°C,full load, 80% confidence limit and nominal line. The MTBF of the power supply shall be calculated accordance with MIL-STD-217D/E. The DC FAN is not included.

☛ 9.0 MECHANICAL REQUIREMENTS

9.1 Physical Dimension : 150*140*86mm

（線材組合&外露長度僅供參考，可根據客戶要求更改或新增。）

500W/600W/700W全出线



9.2 Connectors (INTEL approved equivalent)

P1 (Motherboard 20+4Pin) Power Connector

18AWG wire	Signal	Pin	Pin	Signal	18AWG wire
Orange	+3.3V	11	1	+3.3V	Orange
Orange(22AWG)	3.3 sense	11			
Blue	-12VDC	12	2	+3.3V	Orange
Black	COM	13	3	COM	Black
Green(20AWG)	PS-ON	14	4	+5VDC	Red
Black	COM	15	5	COM	Black
Black	COM	16	6	+5VDC	Red
Black	COM	17	7	COM	Black
White	NC	18	8	POK	Grey(20AWG)
Red	+5VDC	19	9	+5VSB	Purple
Red	+5VDC	20	10	+12VDC	Yellow
Red	+5VDC	J3	J1	+12VDC	Yellow
Black	COM	J4	J2	+3.3VDC	Orange

P2 (CPU 4+4 Pin) Power Connector

18 AWG wire	Signal	Pin	Pin	Signal	20AWG wire
Yellow	+12V	1	5	COM	Black
Yellow	+12V	2	6	COM	Black
Yellow	+12V	3	7	COM	Black
Yellow	+12V	4	8	COM	Black

P3,P4(6+2Pin) Power Connector

18 AWG wire	Signal	Pin	Pin	Signal	20AWG wire
Yellow	+12V	1	4	COM	Black
Yellow	+12V	2	5	COM	Black
Yellow	+12V	3	6	COM	Black
Black	+12V	1	2	COM	Black

P5,P6,P7,P8 (大4PIN&小4PIN) Power Connector

18 AWG wire	Signal	Pin
Yellow	+12V	1
Black	COM	2
Black	COM	3
Red	+5V	4

P9,P10,P11,P12,P13,P14 (S-ATA) Power Connector

18 AWG wire	Signal	Pin
Orange	+3.3V	5
Black	GND	4
Red	+5V	3
Black	GND	2
Yellow	+12V	1

☞ 10. FAN SPEED CONTROL(OPTION)

Main fan voltage varies with the ambient temperature or output power.